

CLAIMS:

What is claimed is:

1. A protective barrier on a processing element utilized in a processing system for performing a process comprising:
  - a bonding layer coupled to said processing element, wherein said bonding layer comprises a layer formed using plasma electrolytic oxidation; and
  - a protective layer coupled to said bonding layer and configured to be exposed to said process.
2. The protective barrier as recited in claim 1, wherein said bonding layer comprises Keronite.
3. The protective barrier as recited in claim 2, wherein said Keronite comprises a transition layer, a primary layer, and an outer layer.
4. The protective barrier as recited in claim 3, wherein said protective layer is coupled to said bonding layer after at least a portion of said outer layer is removed using at least one of polishing, grinding, and grit blasting.
5. The protective barrier as recited in claim 1, wherein said protective layer comprises a compound containing at least one of a III-column element and a Lanthanoid element.
6. The protective barrier as recited in claim 5, wherein said III-column element comprises at least one of Yttrium, Scandium, and Lanthanum.
7. The protective barrier as recited in claim 5, wherein said Lanthanoid element comprises at least one of Cerium, Dysprosium, and Europium.
8. The protective barrier as recited in claim 1, wherein said protective layer comprises at least one of  $\text{Al}_2\text{O}_3$ , Yttria ( $\text{Y}_2\text{O}_3$ ),  $\text{Sc}_2\text{O}_3$ ,  $\text{Sc}_2\text{F}_3$ ,  $\text{YF}_3$ ,  $\text{La}_2\text{O}_3$ ,  $\text{CeO}_2$ ,  $\text{Eu}_2\text{O}_3$ , and  $\text{Dy}_2\text{O}_3$ .

9. The protective barrier as recited in claim 1, wherein the processing element comprises at least one of a metal, a silicon based material, and a ceramic.

10. The protective barrier as recited in claim 1, wherein the processing element comprises aluminum.

11. The protective barrier as recited in claim 1, wherein the process comprises a plasma.

12. A method of forming a protective barrier on a processing element utilized in a processing system for performing a process comprising:  
applying a bonding layer to said processing element, wherein said application of said bonding layer comprises plasma electrolytic oxidation; and  
applying a protective layer to said bonding layer.

13. The method as recited in claim 12, wherein said bonding layer comprises Keronite.

14. The method as recited in claim 13, wherein said Keronite comprises a transition layer, a primary layer, and an outer layer.

15. The method as recited in claim 14, wherein said outer layer is removed using at least one of polishing, grinding, and grit blasting.

16. The method as recited in claim 12, wherein said protective layer comprises a compound containing at least one of a III-column element and a Lanthanoid element.

17. The method as recited in claim 16, wherein said III-column element comprises at least one of Yttrium, Scandium, and Lanthanum.

18. The method as recited in claim 16, wherein said Lanthanoid element comprises at least one of Cerium, Dysprosium, and Europium.

19. The method as recited in claim 12, wherein said protective layer comprises at least one of  $\text{Al}_2\text{O}_3$ , Yttria ( $\text{Y}_2\text{O}_3$ ),  $\text{Sc}_2\text{O}_3$ ,  $\text{Sc}_2\text{F}_3$ ,  $\text{YF}_3$ ,  $\text{La}_2\text{O}_3$ ,  $\text{CeO}_2$ ,  $\text{Eu}_2\text{O}_3$ , and  $\text{DyO}_3$ .